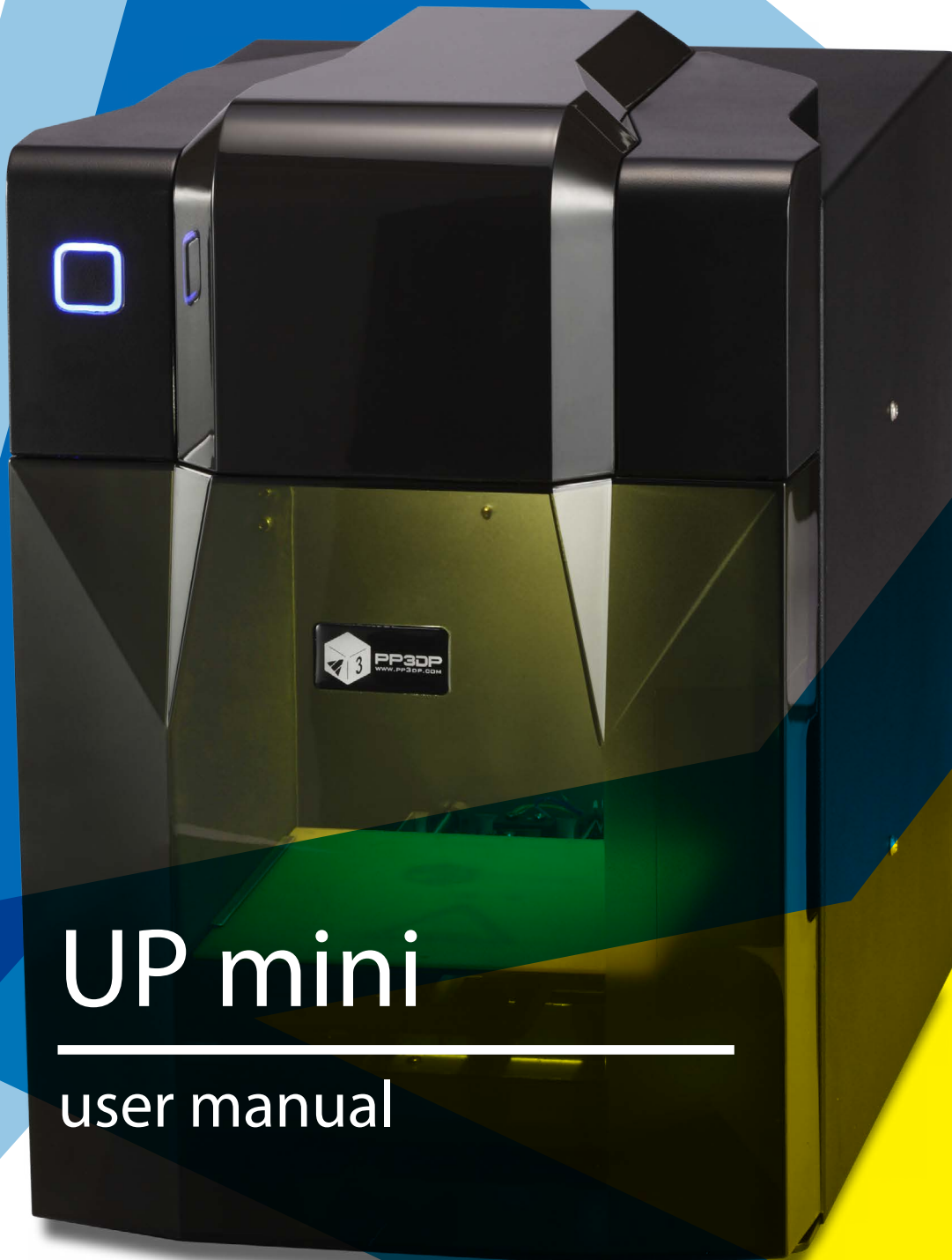




Tiertime
太尔时代



UP mini

user manual

version: 4.6.23

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Precautions

1. UP mini 3D printer requires power adapter provided by original manufacturer. Otherwise it could casue damage to machine or even fire hardzard. Please also keep the power adapter away from water and high temperature.
2. During printing, the nozzle of the printer will reach 260°C and the print platform could reach 60°C. Please do not touch these parts with bare hand while they are hot, not even with the heat resistant gloves included with machine as the temperature could damage the glove and your hand.



*Warning label on printer:
High Temperature, do not touch!*

4. During Printing, the nozzle and print platform will move at high speed, do not touch these parts while they are moving.



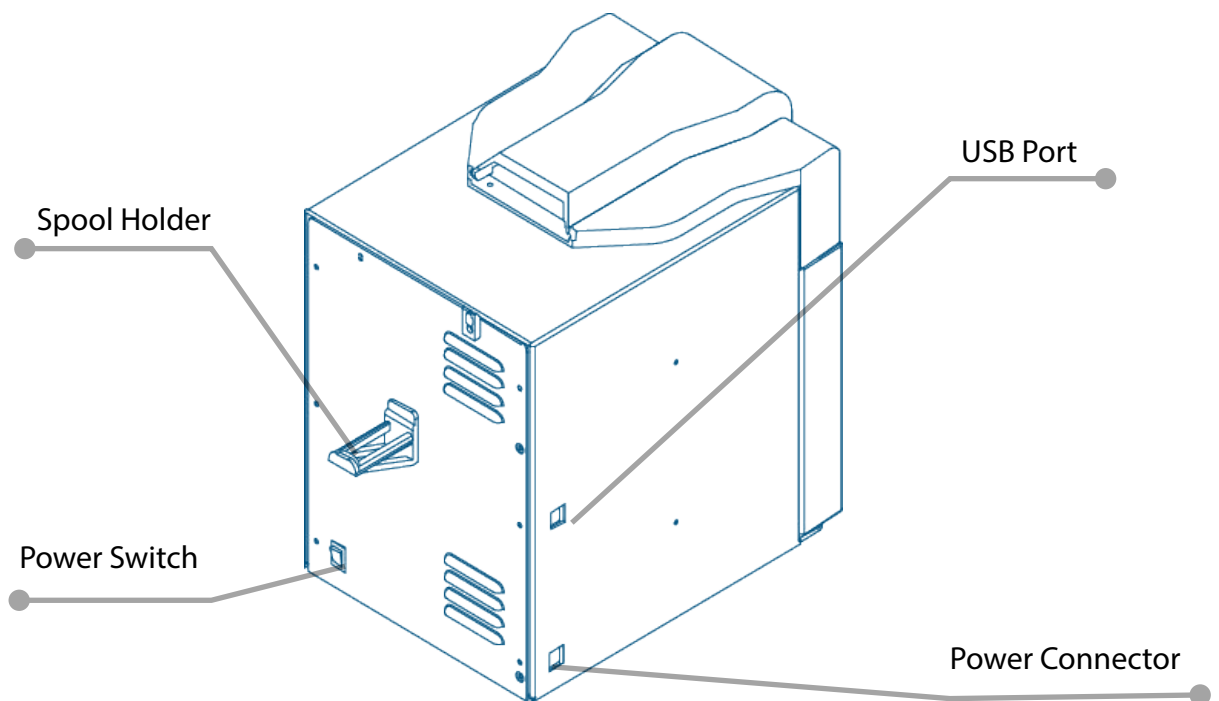
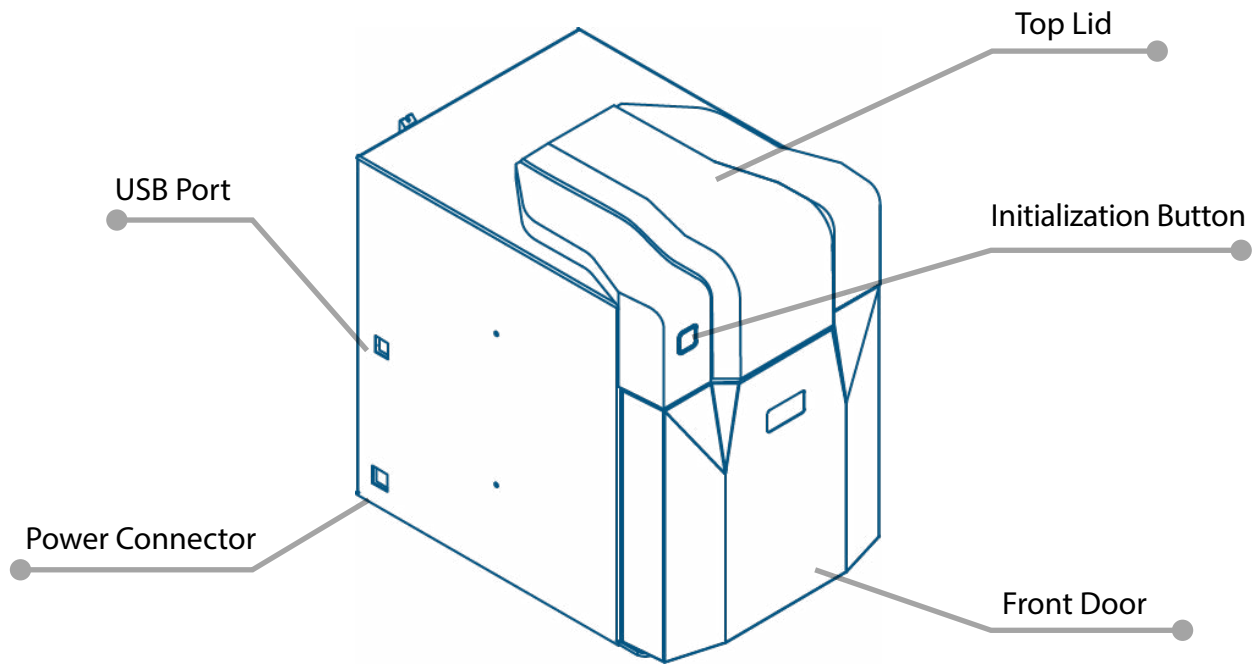
*Warning label on printer:
Moving parts, do not touch!*

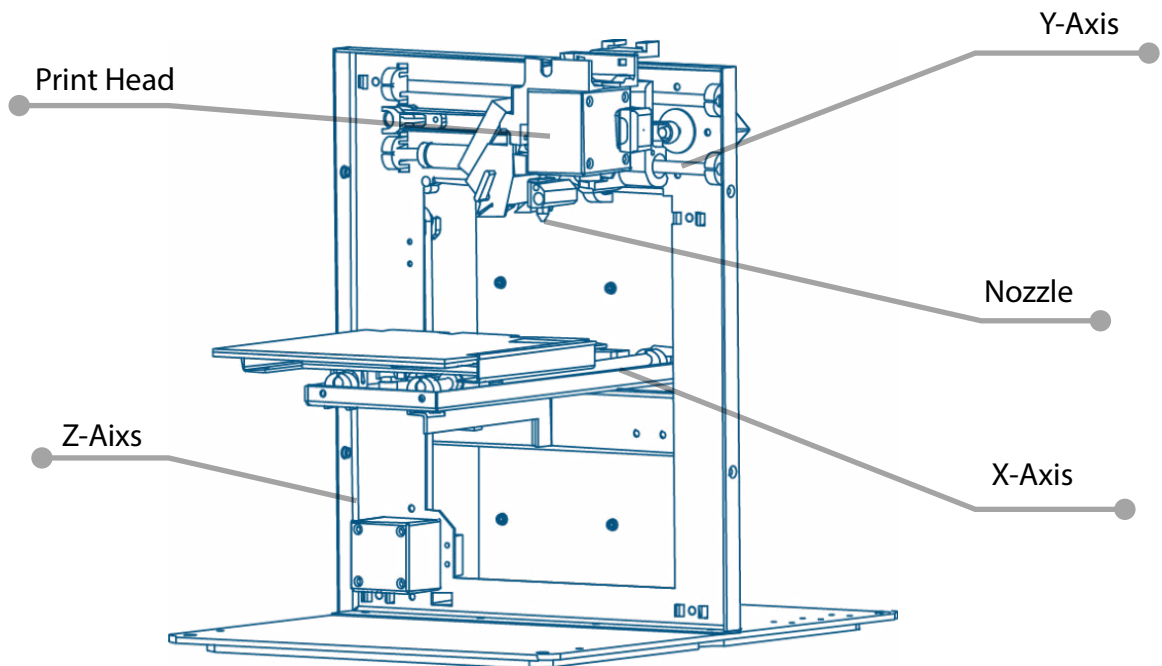
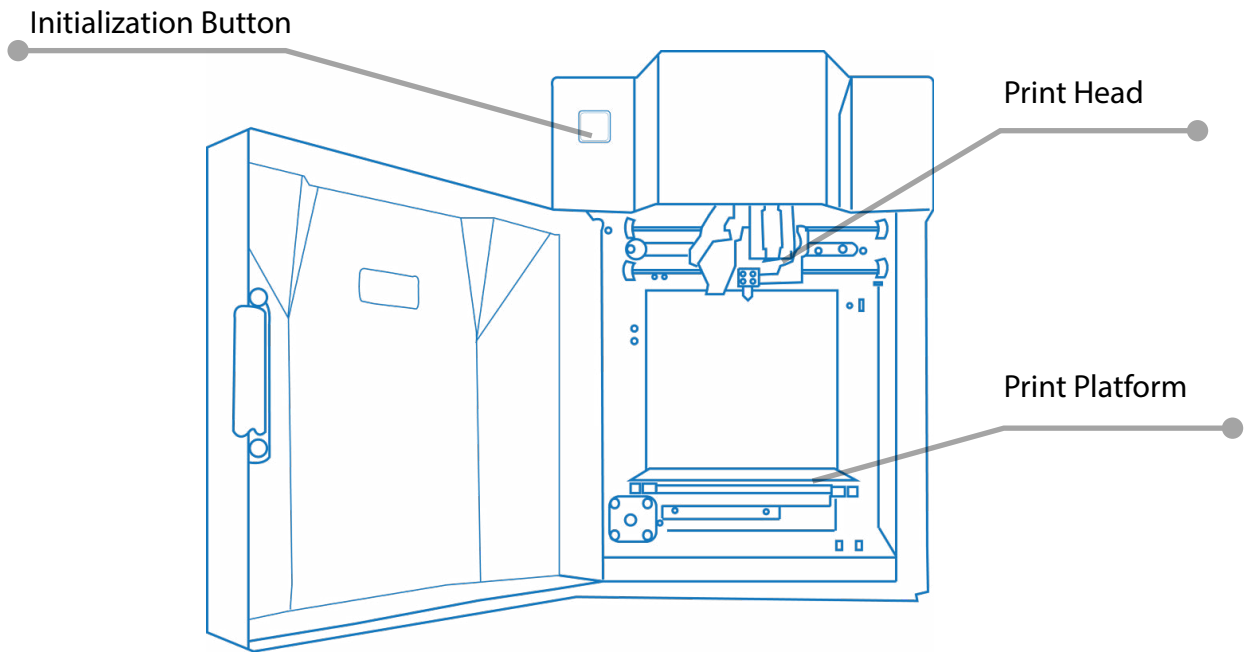
5. Please wear goggles when removing the supporting material from model and detaching model from perf board.
6. When printing ABS and PLA, slight smell will be produced, please run the printer in a well ventilated environment. We also suggest you to put the printer in an enviroment with stable temperature, as unwanted cooling could has adverse effect on print quality.
7. When UP softwre is sending data to printer, where the status bar on the left bottom corner is showing "sending layers", do not unplug USB cable, as this will interrump data transfer and results in printing failure. USB cable can be unplugged after data printing started.
8. UP mini's working temperature is between15°C and 30°C relative humidity 20%-50%. It is recommended to discharge static charge from user's body before touching the machine to prevent interruption of printing and damaging the printer.

UP mini Specification

Printing	Technology	MEM (Melted Extrusion Manufacturing)
	Build Volume	120x120x120mm
	Print Head	Single, Modular for easy replacement.
	Z-resoution	0.2/0.25/0.3/0.35mm
	Supporting Structure	Automactically generated, easy to remove, adjustable
	Platform Leveling	Manual
	Print Surface	Heated bed with perf board
	Unterthered Printing	Yes
Software	Bundled Software	UP Software
	Compatible File Formats	STL, UP3, UPP
	Connectivity	USB
	Operating System	WinXP/Vista/7/8, Mac OS
Power Supply	Poweradapter	110-240VAC, 50-60Hz, 220W
Mechanical	Printer Body	Metal Chassis, enlosed.
	Printer Weight	6KG / 13 LB
	Printer Demiension	240(W) x 355 (H) x 240 (D)mm
	Weight with Packaging	11.2KG / 25LB

Printer Body illustration





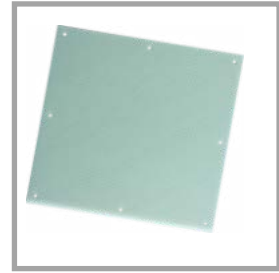
Accessories



USB Cable



Power Adapter



Perf Board



Spool Holder



ABS Filament



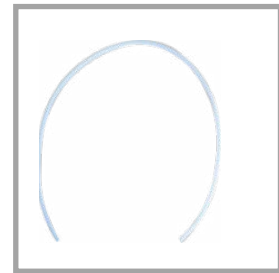
Print Head



Hex Key



Plier



Filament guiding tube



Nozzle Wrench



Gloves



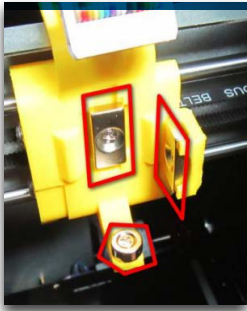
Shovel



Bolts and Nuts

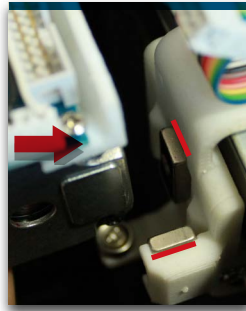
**If anything is missing please contact your local distributor or support@pp3dp.com*

Installing the Print Head



1

There are 3 magnets for holding the print head in place.



2

During installation make sure the magnets are aligned to the metal plates on the print head's stepper motor.

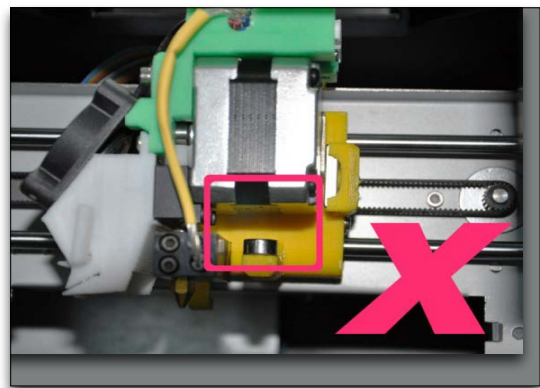
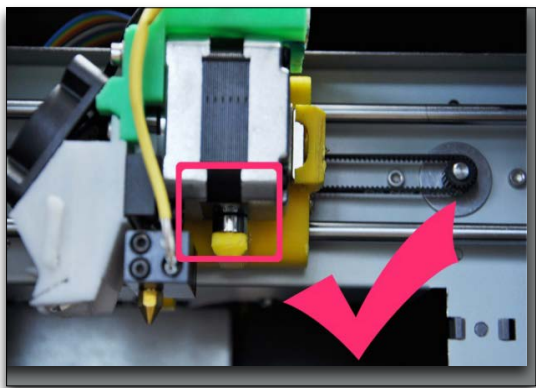


3

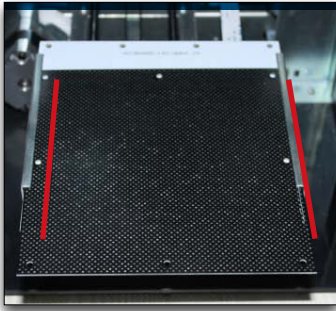
After fitting the print head, plug in the cable to connector residing on the print head.

Correct installation.

Incorrect installation, note the magnet under the print head is not in contact with the motor.

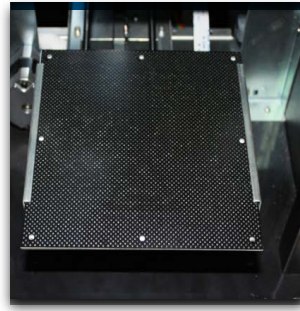


Install the Perf Board



1

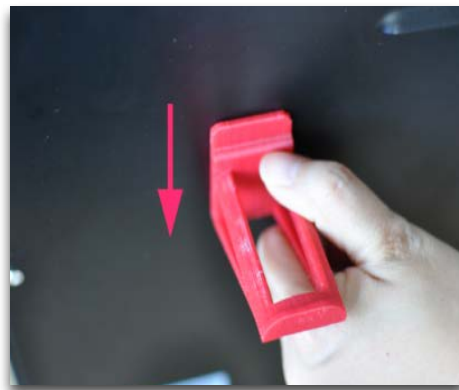
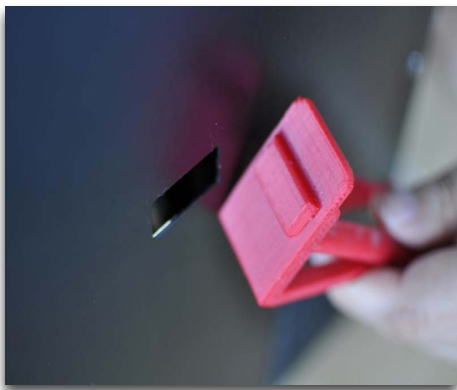
Slide the perf board into the slots on the 2 sides of the platform.



2

Finsihed.

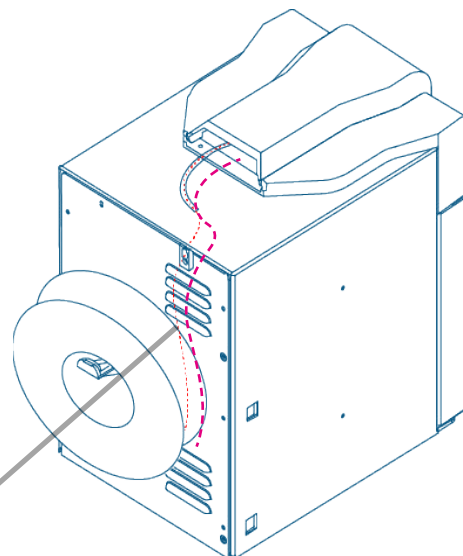
Install the Spool Holder



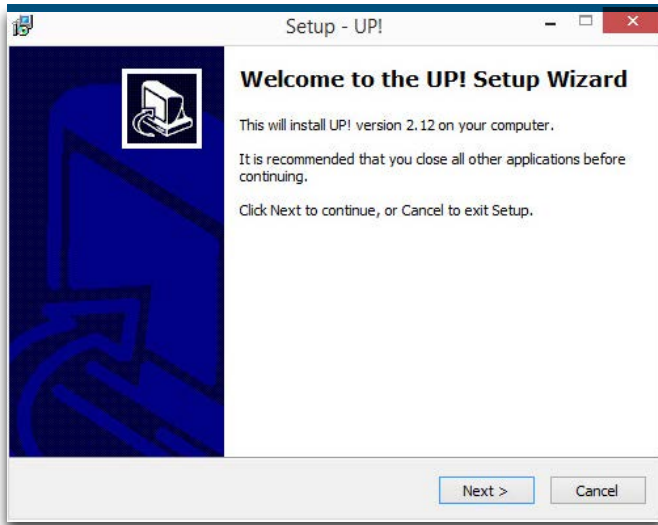
Hook the spool holder on the back of the printer.

Install Filament Spool

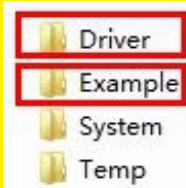
As shown in the diagram, put the filament spool on the spool holder and put the filament through the filament guide tube, then insert the tube into the printer through the hole under the lid.



Install UP software



- UP
1. Go to www.pp3dp.com to download the latest version of UP Software.
 2. Double click UP! Setup.exe to install the software (default installation directory <C:\Program files\UP>) a pop up window will appear, select "install" and following the instruction to finish. The printer's driver is now installed into the system.



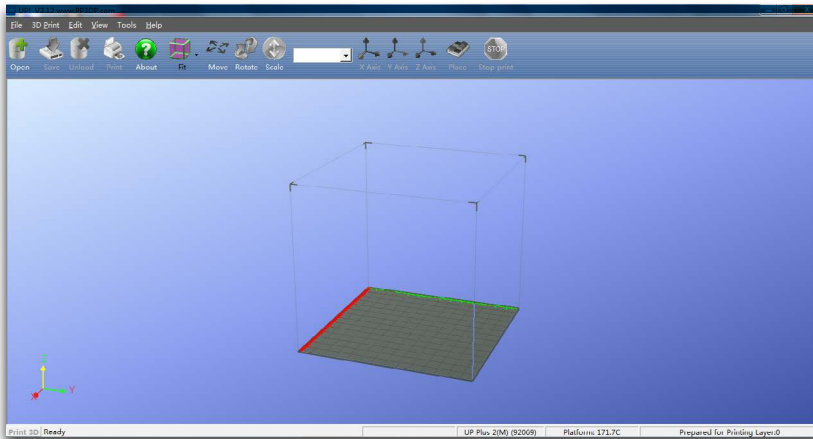
After installation, in the UP folder:
 Driver folder contains the printer drivers.
 Example the example folder contains STL files for the printed parts of UP printers and example files.

Testing of printer driver installation

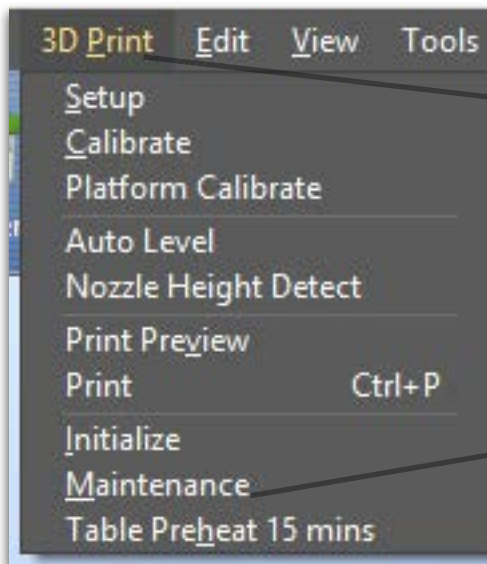
UP

First make sure computer and printer is connected to computer via USB cable and the printer is switched on. The initialization button should be light up in red color.





After driver installation, double click the desktop icon of UP software to open it.



Click "3D Print".

"Initialize" and "Maintenance" options will light up and available for selection. This indicates the successful installation of printer driver.

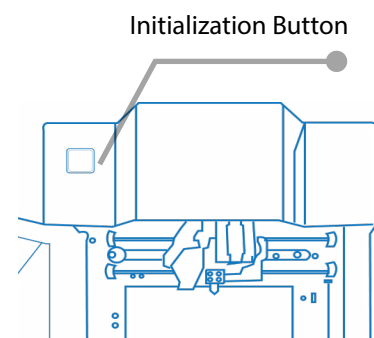
Initialization of printer

Initialization is required for every time the machine is switched on. During initialization the XYZ axes will move slowly and hit the endstops. This is essential as the printer needs to find the endpoints of each axis.

Two ways of initialization:

1. UP mini can be initialized by clicking the initialization option in the menu which is shown above.
2. The printer has an initialization button on the front of the machine shown in the picture below. When the printer is idle, pressing this button will trigger initialization.

After initialization, the other software options will light up and become available for use. These options can only be chosen after initialization.



The other functions of Initialization Button:

1. Stop current print job: During printing press and hold the button.
2. Switch On/Off print head LED: Quick double hit of the button.

Platform Calibration

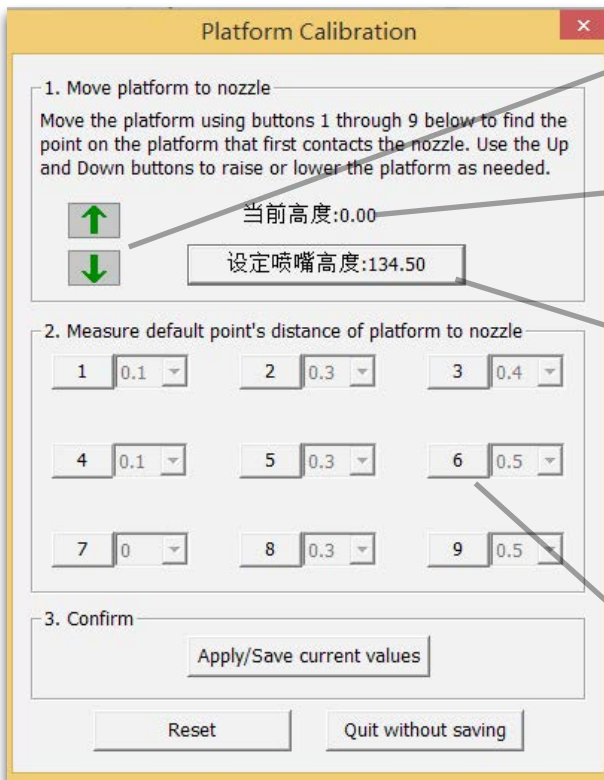
Platform calibrate is the most important step for successful printing, as it ensures the first layer adhesion. The actual calibration is done by measuring the distance between the nozzle and platform. Ideally, the distance between nozzle and platform is constant, but in reality the distance varies at different position due to many reasons (eg. slightly tilted platform.) To calibrate the platform, we just need to tell the machine, on 9 calibration points, the height of platform that is touching the nozzle. The printer will be able to compensate for distal errors based on our measurements. The calibration procedure contains 2 parts:

1. Setting nozzle height.
2. Setting compensation values.

Platform calibration interface:

Open: Menu - 3D Print - Platform calibrate

Interface annotation:



A. Moving Platform UP/DOWN: click/hold the button, platform will move accordingly.

B. Display the current platform height.

C. Setting nozzle height: click this will set the current platform height as the nozzle height.

D. 9 calibration point buttons, represent 9 positions on platform, after clicking the nozzle will move to the corresponding positions. The drop down menu beside the button is for setting leveling compensation values.

Platform Calibrate: 1.Setting Nozzle Height

Setting nozzle height, actually, is not setting the nozzle itself as UP mini's print head does not move in the Z-axis. Here the nozzle height we are referring to is a platform height value, at this height, the platform will be just touching the nozzle (thus "nozzle height"). After setting the value, the platform will be restricted to move over "nozzle height" as the it will start crashing onto the nozzle if going beyond it. The nozzle height value is important for protecting the printer from damages as well as being the basis for calculating leveling compensations.

During the calibration we are measuring distance shorter than 1mm, so we recommend using a print paper as a guide for measurement.

Protocol for setting nozzle height:

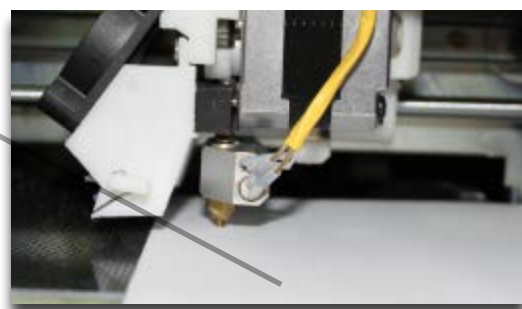
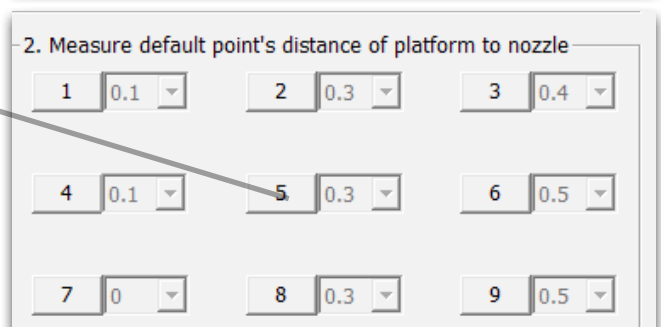
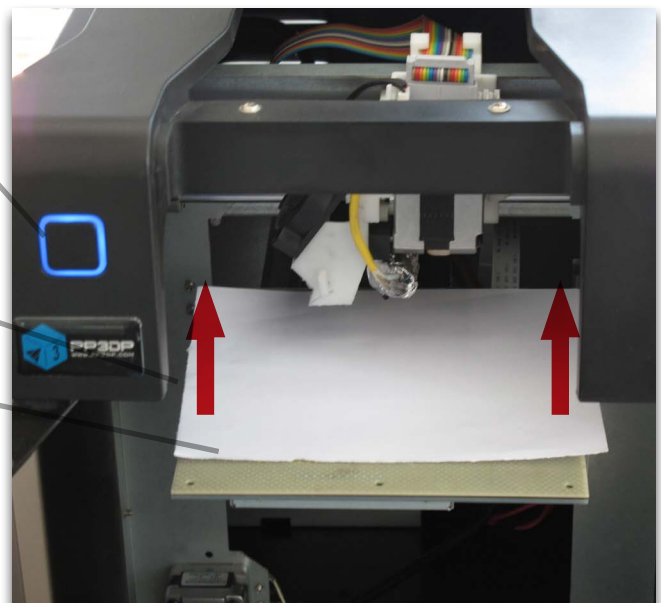
1 Initialize printer

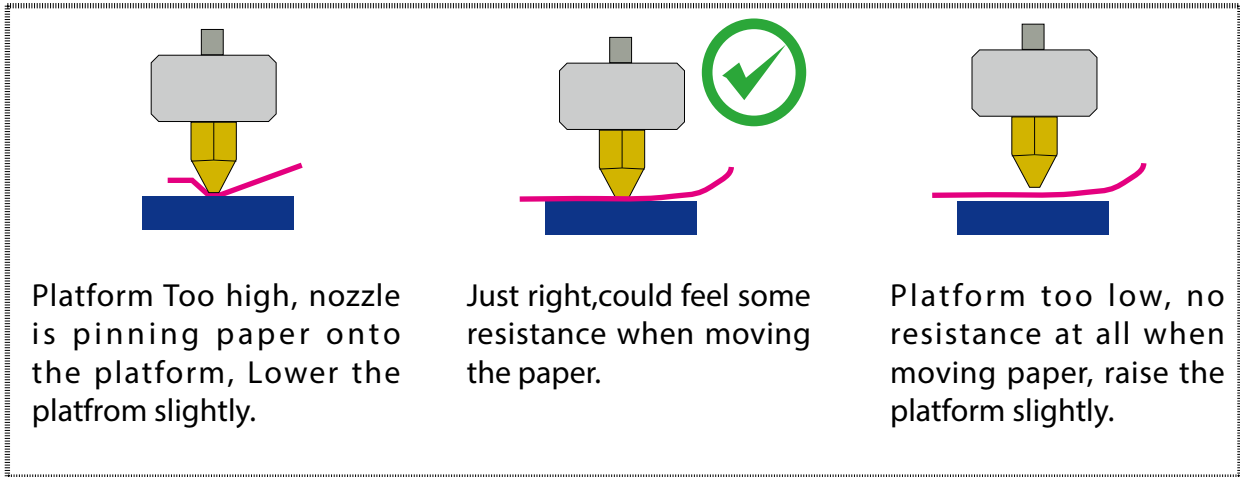
2 Open the calibration interface and press the UP key, note the current height value, stop the platform at about 115.

3 Put print paper on platform.

4 Hit the "5" button.Nozzle will go to the center of the platform.

5 Raise the platform until it is just touching the nozzle. We can move the paper between the nozzle and platform and see if there is any resistance. Like to diagram below.



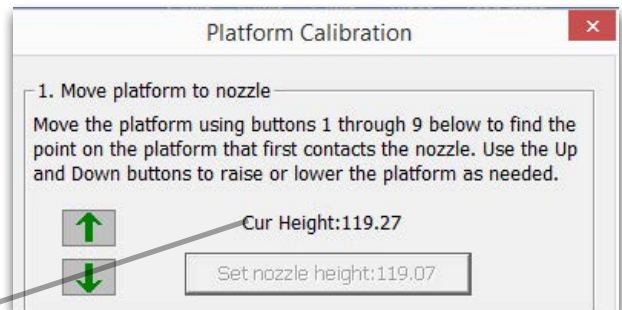


When obtained the right platform height, write down the value of "current height".

We will refer this as the "platform height".

Repeat step 1- 6 for all other 8 positions and obtain their platform height value when touching the nozzle.

6



When obtained the platform value of all 9 positions. Find out the **smallest** value among the 9 calibration points.

As you can see in this case, the calibration point 1 has the smallest platform height value, it is actually the highest point on the platform. (therefore the platform does not need to rise as high as the other points to reach the nozzle)

7

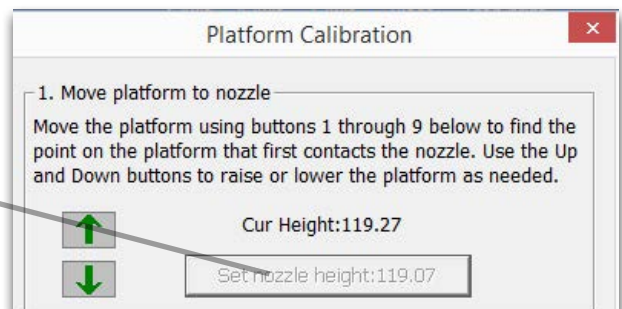
Platform Values at 9 calibration points (hypothetical):

1: 119	2: 119.5	3: 120
4: 119.5	5: 119.9	6: 119.1
7: 119.2	8: 119.4	9: 119.8

We set this height as "Nozzle Height" since it is where the nozzle first starts to touch the platform. Now go to calibration point 1 and rise platform to 119.

Click the button "Set Nozzle Height" to finish.

8



Platform Calibration: 2.Setting Compensation Values

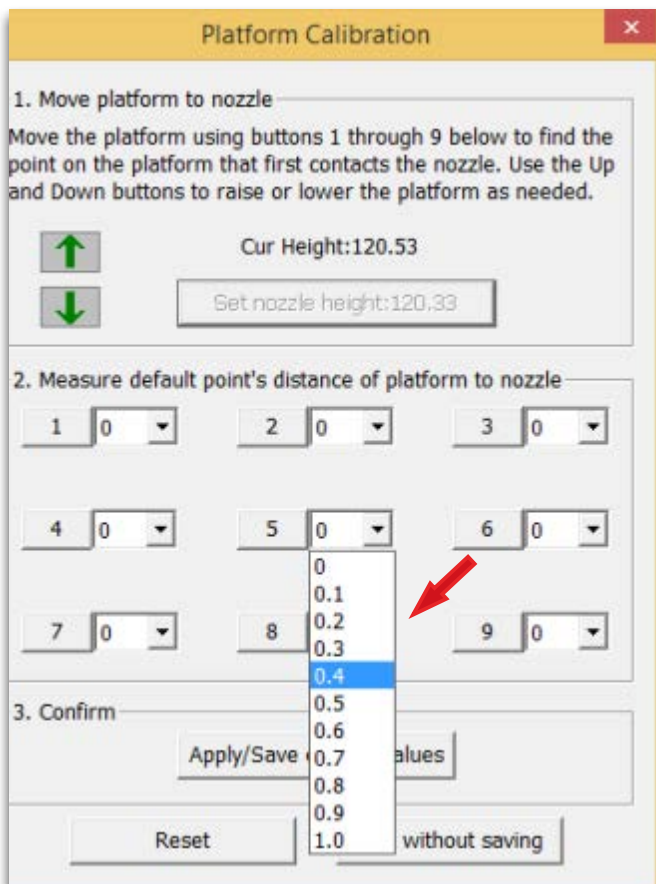


As shown in the left, when platform is at the "nozzle height", only part of the platform is touching the nozzle. Therefore we need to set compensation values for all other calibration points to inform the printer about the distance between nozzle and print surface throughout the XY plane.

After setting the nozzle height, the drop down menu next to the buttons will be available. A compensation value between 0.1 - 1.0 mm will be available for setting.

To calculate compensation value:

$$\text{Platform height} - \text{nozzle height} = \text{compensation value}$$



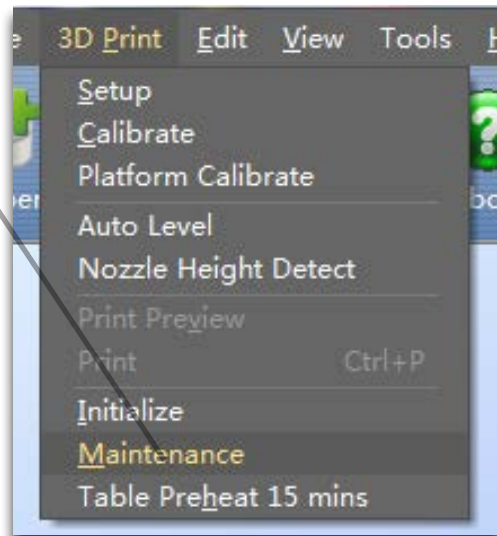
For example, setting the compensation value for calibration point No.3. Assume the "platform height" is 120 and the "nozzle height" is 119, the compensation value should be set to 1.0.

After setting 1.0 in the drop down menu, the nozzle will move to point No.3 and the platform will rise 1 mm. Now we can use the paper again to verify the compensation value.

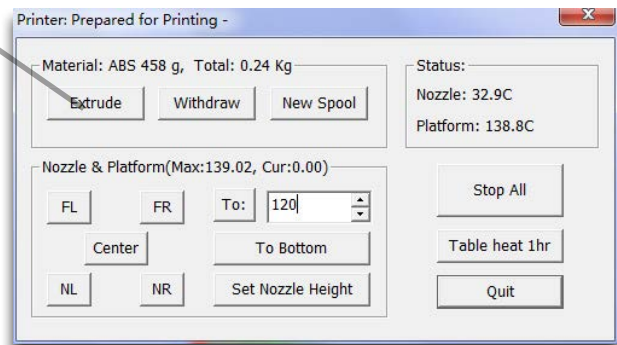
After setting all calibration points click "Apply/Save Current Values" to finish the calibration.

Prepare for Printing

1 Make sure printer switched on and connected to computer. Select Main Menu - 3D Print - Maintenance.



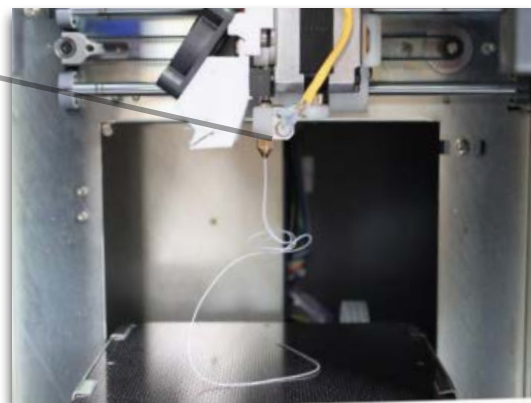
2 Hit "Extrude" button, the print head will start to heat up, within 5 minutes its temperature will reach 260°C, then printer will buzz and the print head starts to extrude.



3 Gently insert the filament into the small hole on the print head. The filament will be feed into the print head automatically when it reach the extruder gear inside the print head.

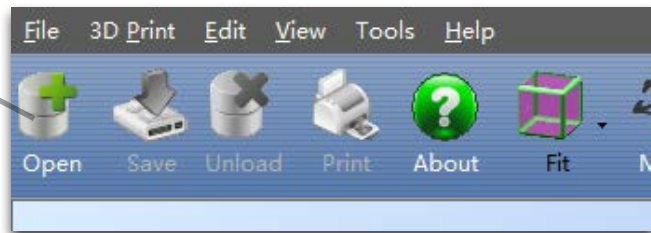


4 Check the nozzle for plastic extrusion. If plastic is coming out from the nozzle that means the print head is ready. The extrusion will stop automatically.

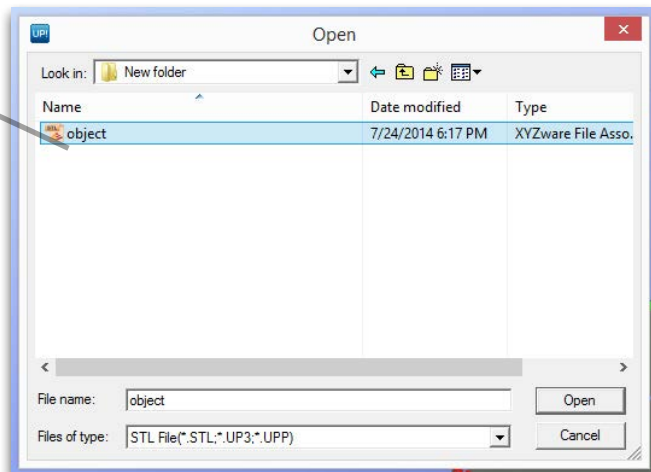


Loading a model

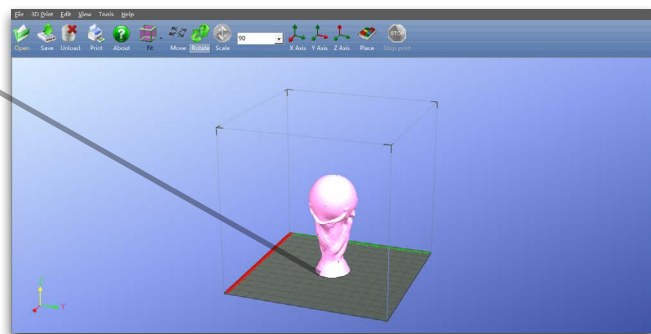
1 Click Load



2 Choose your model.



3 Loaded model on the print plate.

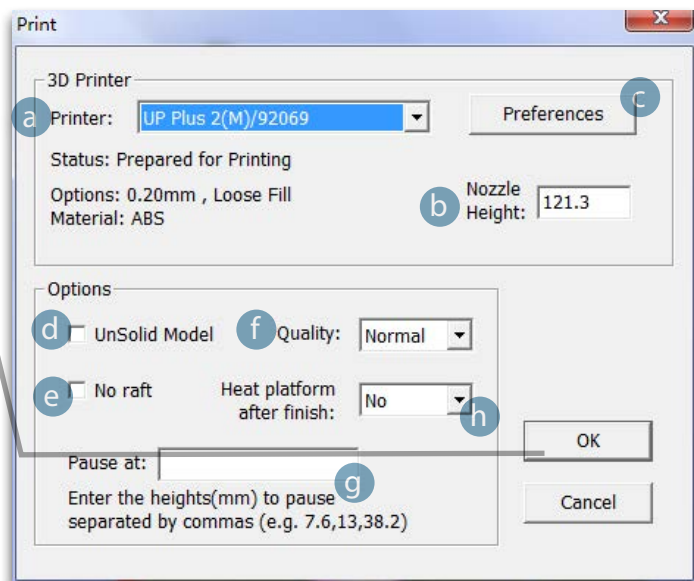


4 Click print to open the print preview window.



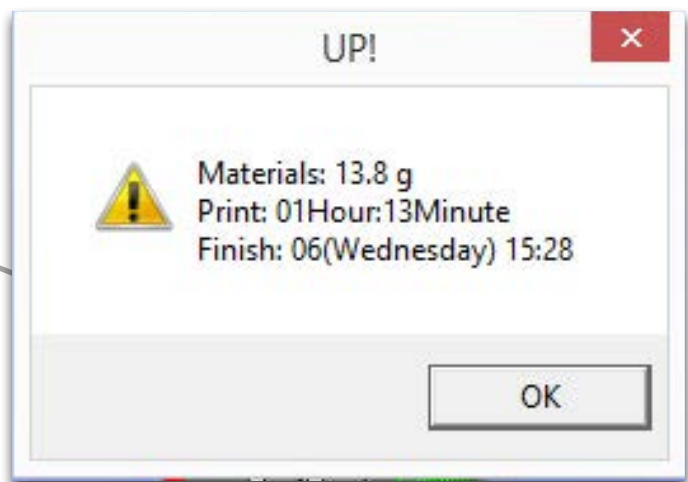
Click "OK" to start printing.
The program will first slice
the model into Gcode and
then transfer the data to
the printer.

5



After sending the data, the
program will suggest the amount
of material and time needed for
the model in a pop up window.
At the same time, the nozzle
will start to heat up. The print
job will start automatically after
clicking "OK"

6

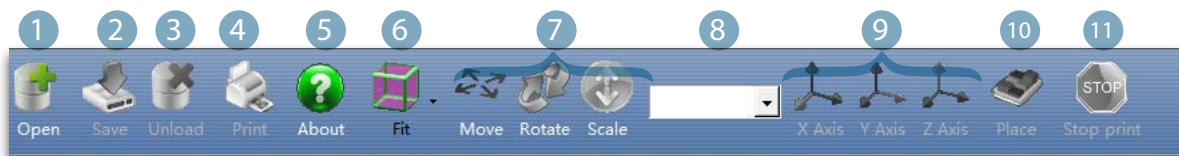
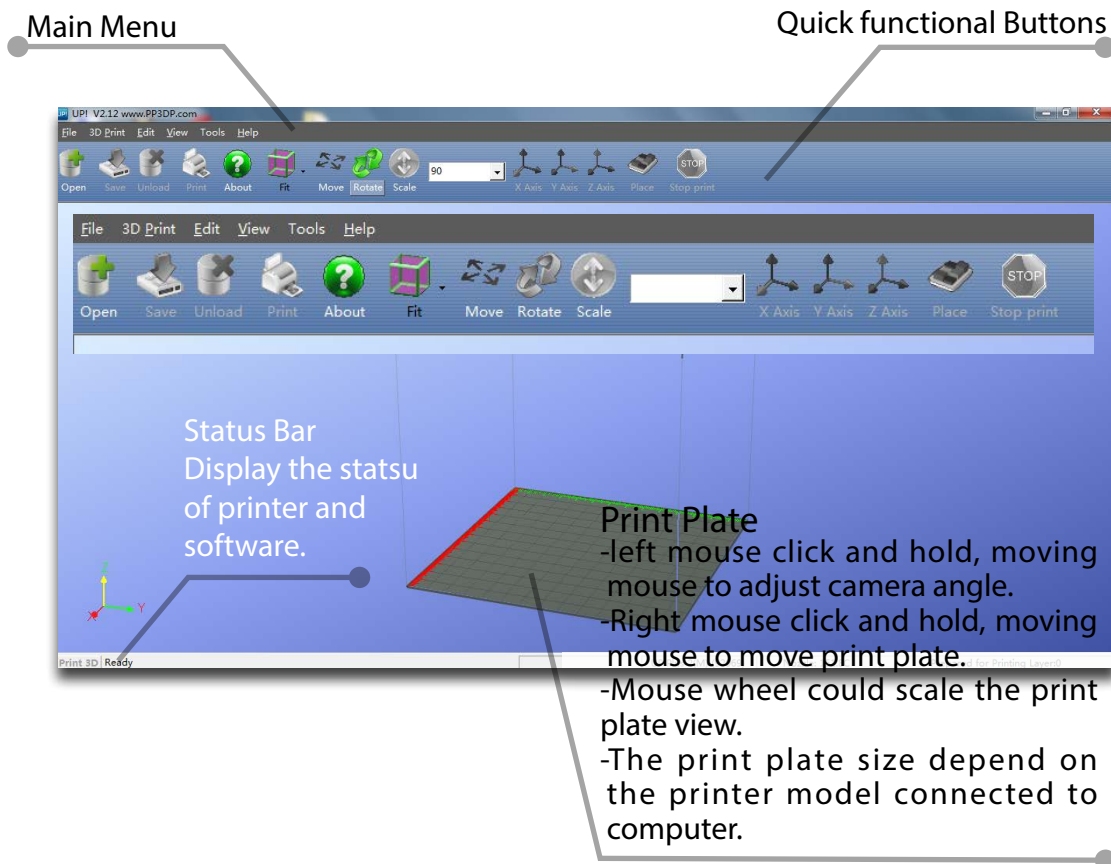


Annotation of Print Preview Interface:

- a. Display the printer model.
- b. Display the nozzle height.
- c. Click to enter printer preference to set printing parameters.
- d. If your model is not solid (defective), turn on this option.
- e. No raft will be printed if this is turned on, print bed leveling will be disabled as well.
- f. Print Quality: the better the print quality the slower the print speed.
- g. Set the pause height, the printer will pause at indicated heightness for changing filaments.
- h. Continuous heating of platform after printing, save heating time for consecutive printing and preventing breakage due to rapid cooling in cold weather.

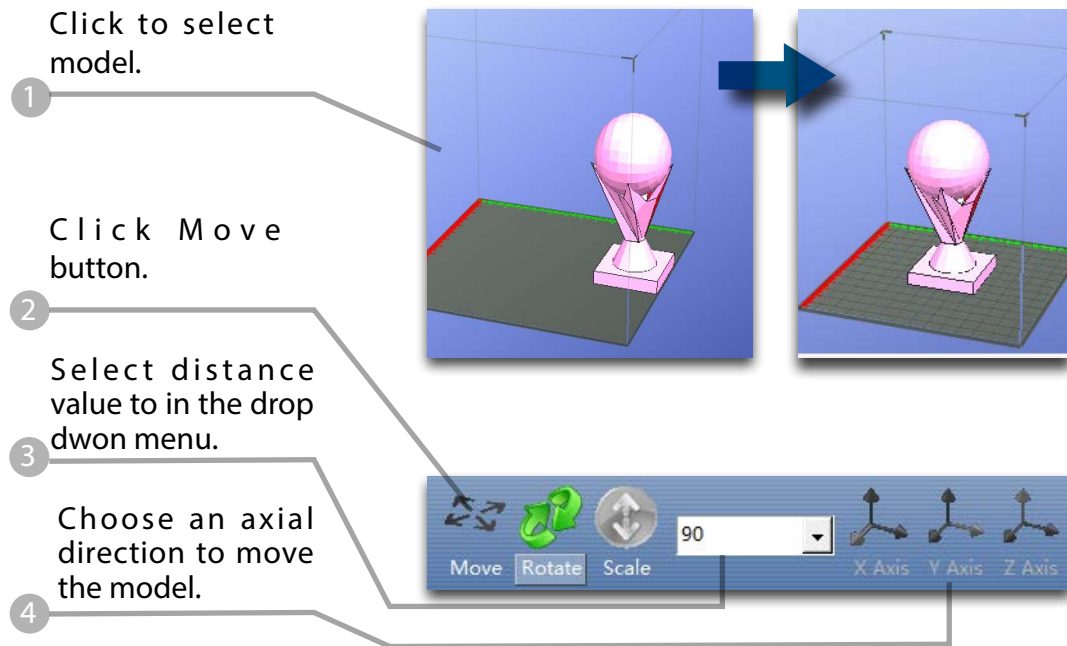
When printer finished receiving the print data, user could disconnect it from computer for untethered printing.

Software Interface



1. Load: Load a model.
2. Save: Save the model into .UP3, a propriatory 3D model file for UP printers.
3. Unload: Unload the selected model.
4. Print: Print the current print plate.
5. About: Display software version, printer model, firmware version and etc.
6. View Perspective: A variety of pre-set of perspective.
7. Adjustments: Move, Rotate, Scale.
8. Set the value of adjustments.
9. Set the orientation of adjustments.
10. Place: Place the model to the center of the print plate. If more than one model exist software will optimize their positions and distance to each other.
11. Stop: If connected to printer, click this will stop the print.(cannot be resumed)

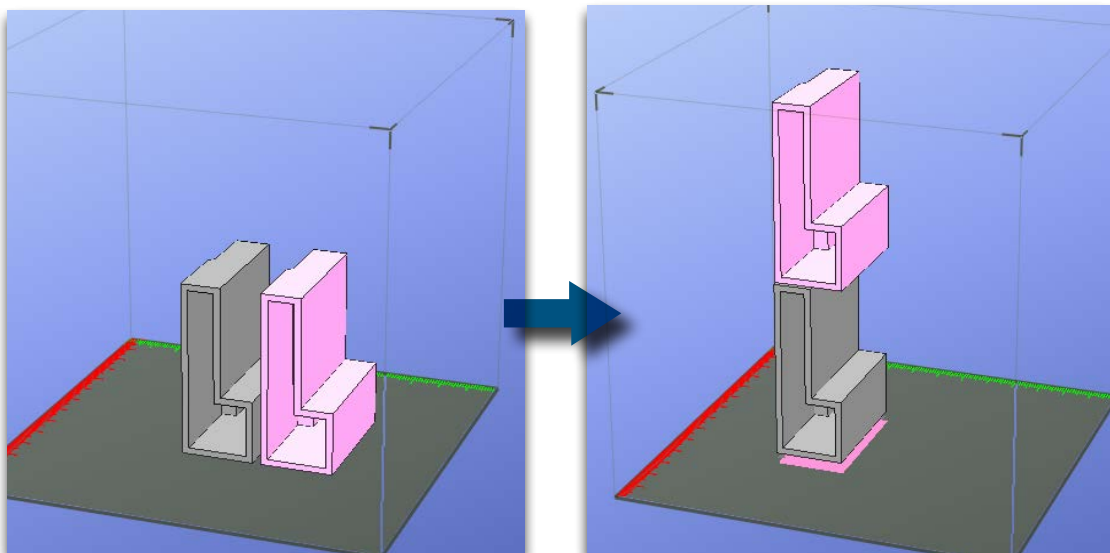
Moving Model



Drag model with mouse on XY-plane: Press and hold Ctrl Key, mouse left click and hold the target model, now the model could be dragged around on XY-plane.

Drag model with mouse on Z-axis: Press and hold Shift Key mouse left click and hold the target model, now the model could be dragged along the Z-axis.

Multiple models could be stacked by moving. They can also be fused into single model by "Merge" function in the "Edit" Menu.



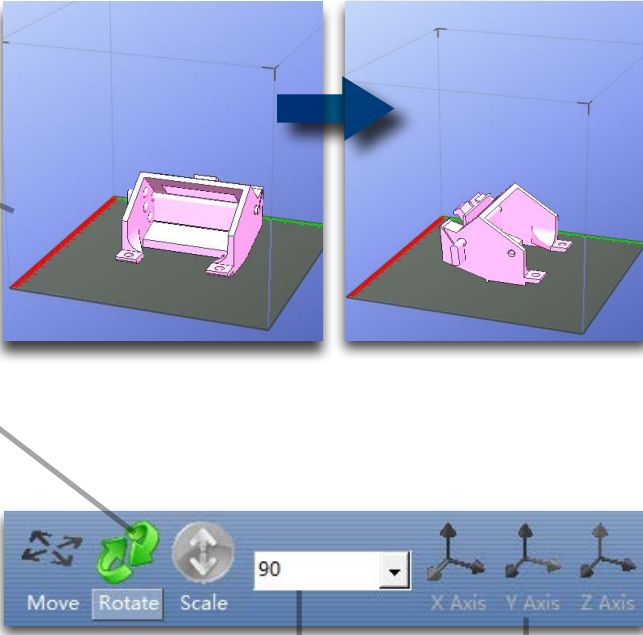
Rotate Model

1 Click to select model.

2 Click Rotate button.

3 Choose angle of rotation in the drop down menu.

4 Choose an axial direction to rotation the model.



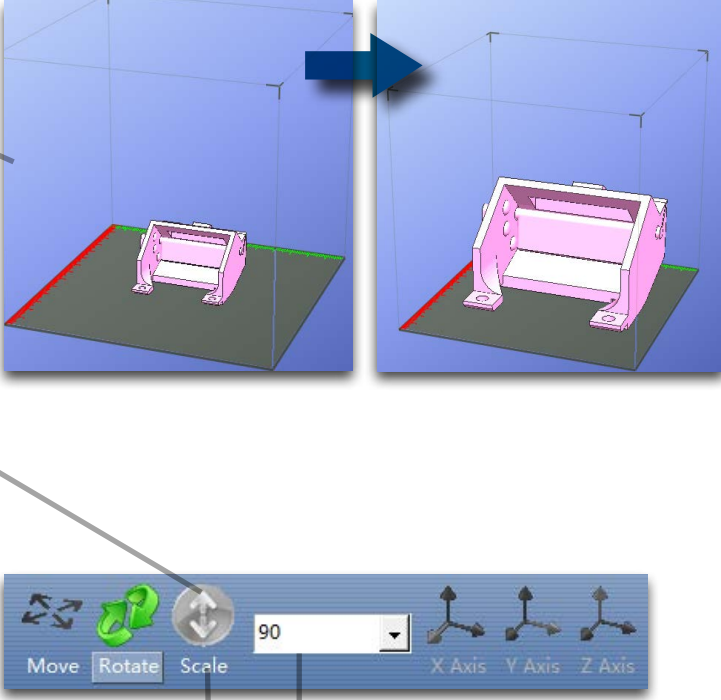
Scale Model

1 Click to select model.

2 Click scale button.

3 Choose the scaling value in the drop down menu.

4 Click the Scale button again to scale.

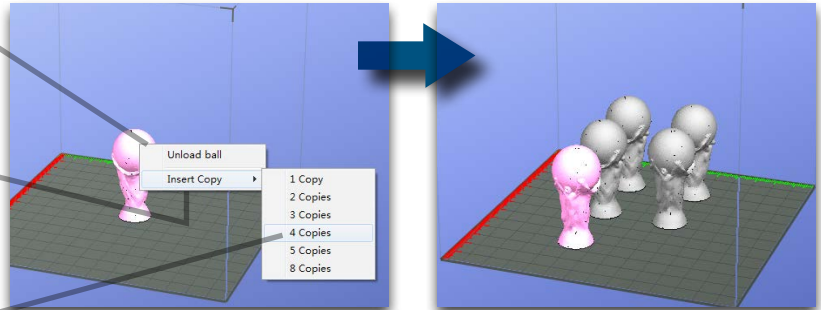


Duplicate Model

1 Click to select model.

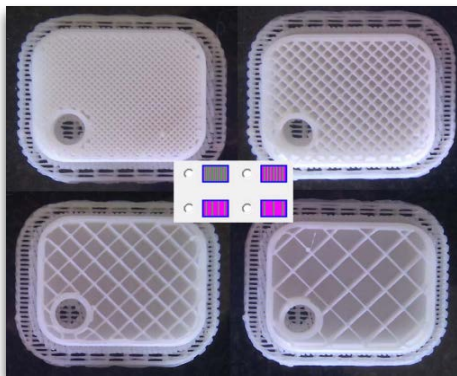
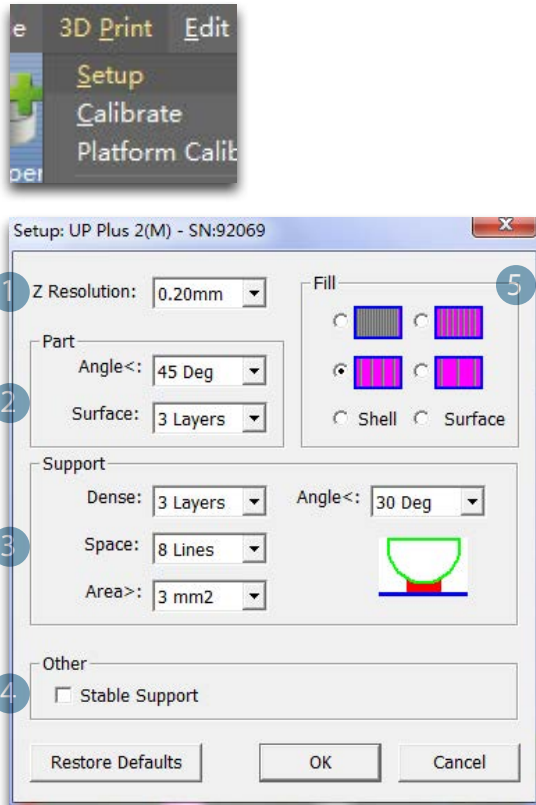
2 After selection, right click to open menu

3 In the insert copy menu, select the number of copy for duplication.



Right click menu also contain unload function. Either choose a specific model to unload or unload all.

Printing Parameters



1. Z-resolution: Thickness of each printed layer, the lower the value, the more details will be generated.
2. Part:
 - Angle: Determine the range of dense support generation.
 - Surface: Choose the how many layers will be made for bottom of the model.
3. Support:
 - Dense: How many layers for dense support generations.
 - Space: Set the density of of support structure, the larger the value the less dense of the supporting structure.
 - Area: If the supporting area is less than this value, no support will be generated. (it is possible to turn off support by choosing only base.)
4. Stable Support: Generate more stable support but more difficult to remove.
5. Infill: The photo shows the effects of 4 different infill options.

Shell



No infill in shell mode.

UP

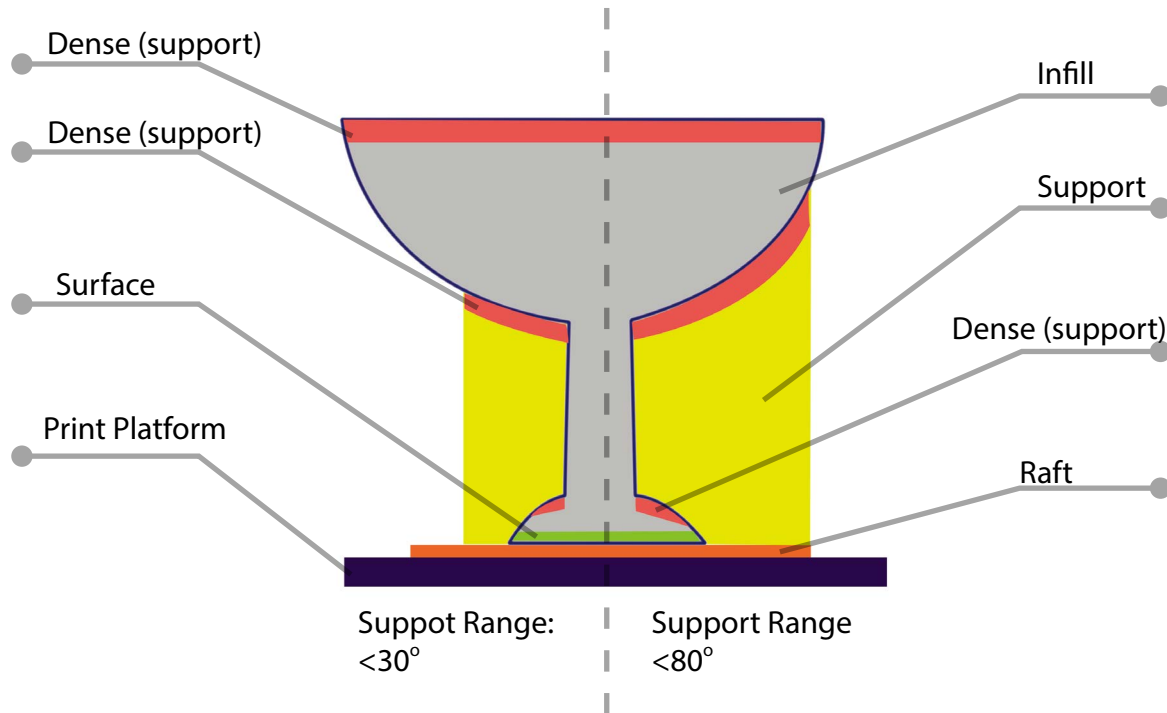
Surface



The object will be printed without bottom layers and top layers. Only a surface with single layer thickness will be made.

UP

Annotation for printing parameters



Dense: Solid support structure to ensure the surface being supported retain its shape and surface finish.

Infill: The inner structure of the printed object, the density of infill could be adjusted.

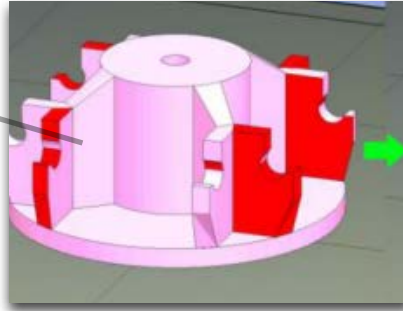
Raft: The thick structure that assist the adhesion of object to the platform.

Surface: the bottom layers of the printed object.

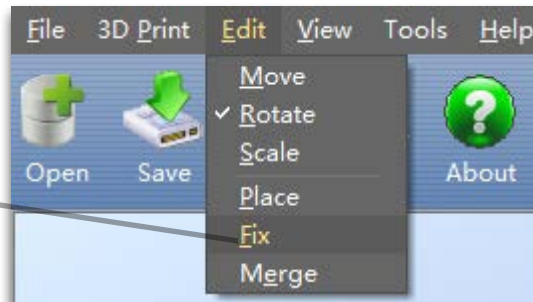
Repair Model

UP software contains model repair function, can be used to fix simple defects.

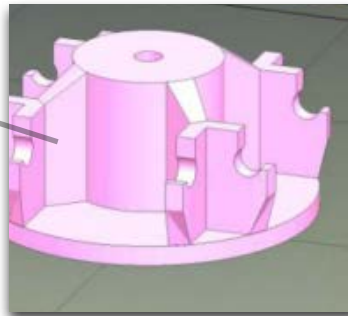
1 If the model contains defects, eg. have holes. The software will highlight the part with red.



2 After selecting the model, choose Edit - Fix to repair the model.



3 Repaired



If the model cannot be repaired, please use other 3D modeling or mesh modifying tools.

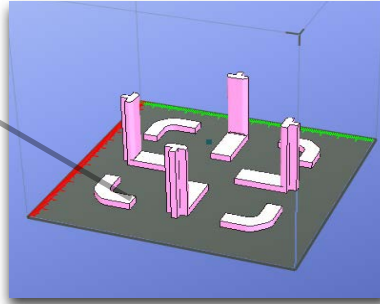
Calibration for the Correct Dimension

If prints are too big or too small or skewed, user could re-calibrate the printer to print in correct dimension. The method is to print a calibration model, measure its dimension and feedback to the software.

Load and print the calibration model:

<C:\ProgramFiles\UP\Example\Calibrate96.UP3>

1

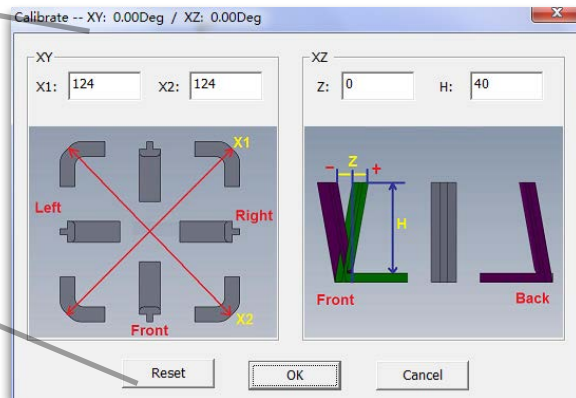


Open: 3D Print - Calibrate
This will open the calibration panel.

2

Hit "Reset" button to revert the value back to default, make sure the upper panel display: XY:0.00 Deg / XZ:0.00 Deg

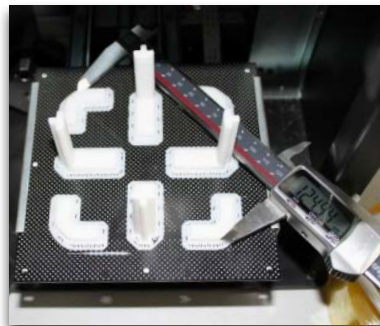
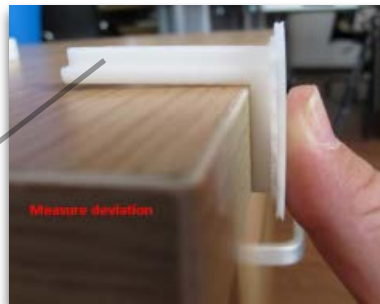
3



Measure the printed model according to the calibration panel.

Input the measured values into the software and finish the calibration.

4



Printing Techniques

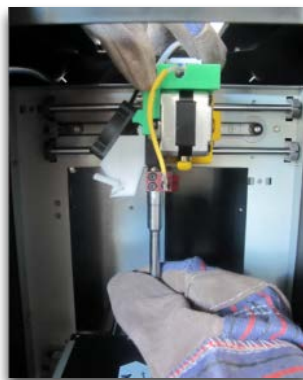
Precautions to ensure print quality:

1. Ensure accurate nozzle height. Nozzle too high will cause warping, nozzle too low will crash into platform causing damage and clogging. It is possible to manually fine tune nozzle height value at "maintenance" and "print preview" panels. User could try to adjust the nozzle height value plus or minus 0.1 - 0.2mm base on previous results.
2. Well calibrate the print platform. unlevelled platform usually cause warping.
3. Give enough time for sufficient pre-heating. Please use the "3D Print" - "Preheat". A well preheated platform is essential for printing large objects without warping.
4. The air flow direction of the fan on the print head is adjustable. There is a small lever on the fan duct, when printing PLA turn the lever anti-clockwisely to direct air flow to nozzle, this will cool the PLA as soon as it is extruded and improve print quality. When printing large object using ABS, to minimize warping, turn the lever clockwisely to direct the air away from nozzle to slow down the cooling. For smaller ABS prints that warping is less likely to happen, user could direct the air to nozzle for better print quality.
5. No raft printing. It is highly recommended to use raft for normal printing as it improves adhesion and is required for leveling compensation, therefore it is turned on by default. User could turn it off in the "Print Preview" panel.
6. No support printing. It is possible to print without generating supporting structures, user can turn it off by choosing "Base Only" in Area drop down menu of printing preference panel.



Remove the nozzle

After a long time of printing, the nozzle could become very dirty or even clogged. We can replace it with a new one while the old one could be cleaned and reused.



1. Use extrude function in the maintenance panel, nozzle will heat up to printing temperature.
2. Wear heat resistance gloves provided.
3. Wipe the nozzle with tissue or cotton.
4. Unscrew the nozzle using the wrench provided.
5. Remove the clog: there are many methods such as drill through the clog using a 0.4mm drill bit, try submerge in acetone or using a heat gun to melt and blow away the clog.

Troubleshooting

Problems	Solution
Printing or platform cannot reach target temp or over heat.	1.Initialize the printer.
	2.Heater cartridge is broken, seek replacement.
	3. Cable is broken, replace the cable.
Cannot extrude plastic	1.Plastic clog the nozzle, replace new nozzle or remove the clog.
	2.The filament is too thick. Usually happens when using filament with poor quality.Please use UP filament.
	3.For some model, if PLA consistently cause problem, switch to ABS.
Cannot detect the printer	1.Install the printer driver correctly.
	2. Check for defective USB cable.
	3. Restart printer and Computer